

THE GENUS *WITTMACKANTHUS* (RUBIACEAE)

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ABSTRACT

The name *Wittmackanthus* is accepted as the correct generic name for *Pallasia* Klotzsch, a later homonym. Assignment of the genus to tribe Cinchoneae, next to *Calycophyllum*, is supported by the combination of vertically imbricate ovules and alate seeds. Previous authors assigned the genus to tribe Rondeletieae, having misinterpreted the placement of the ovules and seeds as horizontal and both as exalate. One species is recognized, *W. stanleyanus*, occurring in Panama, Colombia and Guyana, and its variability is discussed.

One of the most beautiful of Rubiaceae was described in 1844 by Robert Schomburgk from the Rupununi River region of Guyana as *Calycophyllum stanleyanum*. This tree is noteworthy in having one or occasionally two calyx lobes of some flowers expanded into a conspicuous, petaloid, roseate appendage, and is of striking appearance when covered with hundreds of these brightly colored structures.

Several years ago Dr. Lorenzo Uribe Uribe (COL) sent specimens collected in the Department of Santander, Colombia, of a tree which the senior author identified as *Pallasia stanleyana* (Schomb.) Klotzsch, presumed conspecific with the tree from Guyana. Upon comparison with other collections, it became apparent that the taxon, *Pallasia stanleyana*, was in need of critical study, especially from the standpoint of its tribal position within Rubiaceae.

HISTORY OF THE GENUS

Calycophyllum stanleyanum was based upon specimens collected in one of the valleys of the Rupununi River of Guyana, at approximately lat. 3° 55' N, long. 59° 15' W. Klotzsch (1853) without explanation erected the genus *Pallasia* for Schomburgk's taxon. Unfortunately, *Pallasia* Klotzsch is a later homonym, previously having been proposed for four different taxa (see generic synonymy). Walpers (1858), Bentham & Hooker (1873), Schumann (1889, 1891), and Dalla Torre & Harms (1900–1907) have employed the generic name *Pallasia* Klotzsch, and the name was proposed for conservation by Mansfeld (1935), but his proposal was never adopted. The next available name for *Pallasia* Klotzsch is *Wittmackanthus* O. Kuntze (1891). Standley (1930) did not include the genus in his Rubiaceae of Colombia, as no Colombian material was known to him at the time.

MORPHOLOGY AND TRIBAL AFFINITY

In the protologue of *Calycophyllum stanleyanum* no mention was made concerning the position of the ovules, whether vertical or horizontal to the placenta. Klotzsch (1853), followed by later authors, described the ovules and seeds as

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“exalate.” Bentham & Hooker (1873) described the seeds as horizontal. Schumann (1889) followed Klotzsch (1853) and Walpers (1858), except that he stressed the position of the ovules as “horizontaliter affixa,” stating, however, “capsula et semina non visa.”

Our study indicates that the placement of *Wittmackanthus* (*Pallasia* Klotzsch) in tribe Rondeletieae is erroneous due to the misinterpretation of the placentation and to the mistaken idea that the ovules and seeds are exalate. In fact, the ovules, as well as the seeds, are vertically adnate to the placenta and definitely winged, and the ovule body is flattened, peltately attached, and, together with the wing, appressed parallel to the thickish fleshy placenta. The vertically imbricate ovules and winged seeds place *Wittmackanthus* within tribe Cinchoneae, not in tribe Rondeletieae which has horizontal ovules and mostly seeds not winged. These criteria distinguishing tribe Cinchoneae from Rondeletieae have been accepted by most students of Rubiaceae, including Verdcourt (1958) and Bremekamp (1965).

In the protologue, Schomburgk stated, “stamina et ovarium omnino Calycophylli,” and failed to note any irregularity of the corolla or of the stamens. However, starting with Klotzsch (1853) who was followed by Walpers (1858), the corolla was described as “incurva” and the stamens as “inaequilonga.” In his treatment of the Rubiaceae in *Die Natürlichen Pflanzenfamilien*, Schumann (1891) employs the curvature of the corolla as one of the characters differentiating *Pallasia* from *Warszewiczia*, and in his treatment of the family in Martius’s *Flora Brasiliensis*, he (Schumann, 1889) states that the corolla is “leviter sursum curvata.” Actually, such a curvature does not appear to exist, or at best is so inconspicuous that it is easily passed over. Examination of corollas from various collections indicates that while the unequally inserted stamens and somewhat unequal corolla lobes lend a slight asymmetry to the corolla, there is scarcely any curvature, the corolla tube presenting a straight or nearly straight appearance.

GENERIC STATUS

The closest relative of *Wittmackanthus*, as realized by Schomburgk, is *Calycophyllum*. The differences between the two genera are in the stamens and inflorescences. The stamens of *Calycophyllum* are equal and exserted and its inflorescences are cymose or corymbiform. In contrast, the stamens of *Wittmackanthus* are unequal and included, while its inflorescences are spicate.

VARIATION

A study of *W. stanleyanus* shows variation in: a) length and shape of the foliaceous appendage of the calyx lobe, b) length of corolla tube and lobes, c) pubescence of the throat and outer surface of the corolla tube, d) size and apex of leaf-blades, and e) variation of pubescence on the lower surface of the leaf-blades. It was at first believed that two taxa were involved. The Panamanian plant known as *Rondeletia dukei* differed from the Colombian material collected by Uribe in having the foliaceous appendage not only cuneate at base, instead of broadly rounded to subtruncate, but also smaller (1–3.5 cm instead of 4–7 cm

long), the corolla tube shorter (8 mm or less instead of 9–9.5 mm long), the corolla lobes shorter (2–3 mm instead of 4–4.5 mm long), the leaf-blades smaller (5.5–10 × 3.5–6 cm instead of 12–15 × 6–9 cm) with the apical portion obtuse instead of acuminate, and, finally, in having the lower face of the leaf-blades ciliate in the nerve axils instead of pilosulous with spreading hairs along the midrib and lateral nerves. However, other Colombian material is intermediate. For example, in *Haught 4621*, the blade of the foliaceous appendage is 2.5–4 cm long, while that of *Cavender s.n.* is 3.5 cm, and that of *Fosberg 21922* varies from 3 to 6 cm. The length of the corolla, likewise, varies, being 6–7 mm long in *Haught 4621*. The leaves of the Schomburgk collections from Guyana were described as “utrinque glabriusculis,” but these same specimens are described by Schumann (1889) as “subtus ad axillas nervorum puberulis ceterum glaberrimis.” Schomburgk’s collection at NY has a few short hairs along the midrib of the dorsal face of the leaf-blade, whereas in *Haught 4621* and *Fosberg 21922* tufts of hairs appear in the nerve axils or along the secondary nerves where they emerge from the midrib. In the type collection of *Rondeletia dukei* (*Duke 8329*), the hairs along the lower midrib and at its junction with the lateral nerves are denser. Hairs on the peduncles vary from 0.01 mm in *Duke 8329* to 0.02 mm in *Haught 4621*, 0.07 mm long in *Fosberg 21922*, and 0.12 mm long in *Cavender s.n.* While most of the specimens examined have the leaf-blades acuminate at apex, the type collection of *W. stanleyanus* (*Schomburgk 356/411 B* at K) has leaves varying from acute to obtuse or even rounded at apex, even though Schomburgk (1844: 623) originally described them as “acutissimae.” The type collection of *R. dukei* from Panama has blades obtuse to rounded at apex, but may have been collected from an abnormal plant. Finally, the size of leaf-blades is quite variable and has no taxonomic significance.

TAXONOMIC TREATMENT

Wittmackanthus O. Kuntze, Rev. Gen. Pl. 1: 302. 1891. TYPE: *W. stanleyanus* (Schomb.) O. Kuntze.

Pallasia Klotzsch, Monatsber. Akad. Wiss. Berlin 498. 1853; not *Pallasia* Houtt., Handl. II: 382. 1775, Cucurbitaceae; not *Pallasia* Scop., Introd. 72. 1777, Gramineae; not *Pallasia* L. f., Suppl. 37. 1781, Polygonaceae; nor *Pallasia* L’Her. ex Ait., Hort. Kew. III: 498. 1789, Compositae.

Trees or shrubs. Leaves opposite, crowded near apices of the branches, petiolate. Stipules interpetiolar, ± persistent. Inflorescence terminal and axillary, spicate. Flowers subzygomorphic, 4–6-merous. Calyx cupular, deeply 4–6-fid, the lobes persistent to deciduous. Corolla tubular, straight or nearly so, the lobes imbricate in aestivation. Stamens unequal, 3 often included and 2 slightly exserted, attached to the upper part of corolla tube; anthers versatile, sagittate at base; pollen 3-colpate, smooth. Disc cupulate. Stigma sub-bilobate. Ovary bilocular; ovules ∞, anatropous, vertically imbricate and adnate to the fleshy elongated placenta, narrowly winged. Capsule septicidally dehiscent, crowned by the calyx. Seeds vertically imbricate, narrowly winged. Embryo, very small, embedded in a fleshy albumen; cotyledons ovate, obtuse; radicle cylindrical.

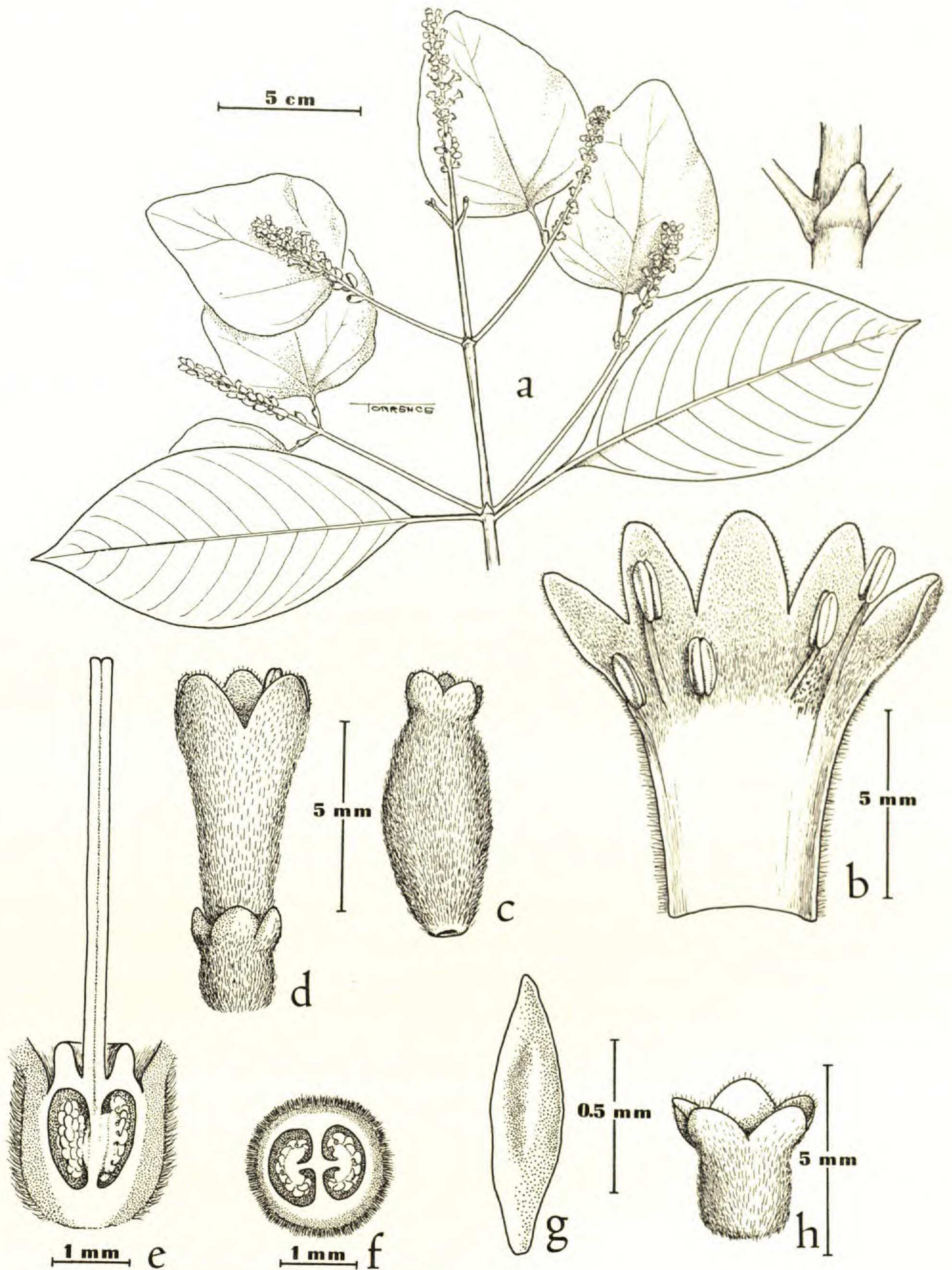


FIGURE 1. *Wittmackanthus stanleyanus*.—a. Habit of flowering branch.—b. Corolla; internal view showing unequal stamens.—c. Capsule.—d. Corolla with calyx and hypanthium.—e. Vertical section through ovary.—f. Transverse section through ovary.—g. Seed.—h. Calyx and hypanthium.

Wittmackanthus stanleyanus (Schomb.) O. Kuntze, Rev. Gen. 1: 302. 1891.—

FIG. 1.

Calycophyllum stanleyanum Schomb., Jour. Bot. (Hooker) 3: 622, t. 23, 24. 1844.

Pallasia stanleyana (Schomb.) Klotzsch, Monatsber. Akad. Wiss. Berlin. 498. 1853; Walper, 1858, p. 122; Bentham & Hooker, 1873, p. 48; Schumann, 1891, p. 36; Schumann, 1889, p. 219; Dalla Torre & Harms, 1907, no. 8176; Mansfeld, 1935, p. 443.

Rondeletia dukei Dwyer & Hayden, Ann. Missouri Bot. Gard. 54: 144, fig. 4. 1967.

Trees or shrubs, 4–15 m tall, the young stems puberulent to glabrous. Stipules erect-appressed, triangular-ovate, obtuse to subacute, 3.5–6 mm long and 2–4 mm wide, glabrous or puberulous along margins and apex. Leaf-blades firmly membranous, oblong- or ovate-elliptic or obovate, acute or acuminate to obtuse or rounded at apex, cuneately acute at base, 4–17 cm long and 3–9.5 cm wide, glabrous above, glabrous below except along midrib or in axils, and/or along some lateral nerves near their junction with midrib where spreading-pilose; lateral nerves 8–15 each side, curved-ascending, inconspicuously anastomosing 1–4 mm from margin, impressed above, slightly elevated below; tertiary venation manifestly reticulate, conspicuous on both sides. Petioles 1–5 cm long, canaliculate and marginally puberulous above, otherwise sparsely puberulent to glabrous. Inflorescence of terminal or axillary pedunculate spikes, usually trichotomous or only the central spike developed; peduncles 2.5–8 cm long, \pm puberulent with the hairs 0.01–0.12 mm long; rachis of spikes erect, closely many-flowered, 2.5–9 cm long, 0.5–2 cm in diameter. Flowers alternate to subverticillate, sessile or the lowest shortly pedicellate, subtended by an outer larger bract and two smaller bracteoles. Bract deciduous, ovate to oblong-lanceolate, acute, 1.5–4 mm long and 1–1.5 mm wide, puberulous without; bracteoles paired, deciduous in fruit, suborbicular to ovate-oblong, rounded or subtruncate, 0.5–1.5 mm long and 0.7–1.5 mm wide, puberulous without and ciliolate. One, rarely 2 calyx lobes of some lower flowers expanded into a showy clawed blade, the claw 2–5 mm long, pilosulous, the blade membranous, pink, purplish-pink, or rose-lilac, suborbicular-ovate to broadly ovate, obtuse to rounded at apex, broadly rounded or subtruncate to cuneately subacute at base, 1–7 cm long and 1.8–6 cm wide, 5–7-plinerved, the tertiary veins laxly and grossly reticulate, the secondary nerves together with the midnerve puberulous, elsewhere glabrous to glabrate on both surfaces. Calyx of the other flowers deeply 4–6-fid, the lobes subpersistent to caducous, suborbicular to broadly ovate or oblong, rounded to obtuse at apex, 1.4–2 mm long and 1–2 mm wide, villosulous without, glabrous within. Hypanthium narrowly oblong to urceolate, 1.5–2 mm long and 1.5–2 mm wide, longer than the bracteoles, densely buff- to cinereous-sericeous. Disc shallowly repand-lobulate, 0.4 mm high, 1 mm in diameter. Corolla purplish, 8–13.5 mm long, the tube 6–9.5 mm long, 1.7 mm wide at base, 3 mm wide at orifice, densely hirtellous to substrigose without, glabrous within except densely pilosulous to sparsely puberulent at orifice and near summit. Anthers narrowly oblong, 0.8–1.5 mm long; filaments 0.3–3 mm long, glabrous. Style 6–9 mm long, glabrous, slightly exerted beyond orifice. Ovules oblong to subelliptic-oblong. Capsule (immature) narrowly oblong to oblong-turbinate, 4–10 mm long and 2.5–4 mm wide, densely appressed-pubescent to hirsutulous. Seeds pale brown, narrowly fusiform, 0.8–0.9 mm long and 0.1 mm wide.

Distribution: Wet forests at low altitudes (60–200 m), of Panama, Colombia and Guyana.

Specimens examined: PANAMA. DARIÉN: Río Pirre, *Duke* 8329 (NY, isotype of *Rondeletia dukei*).

GUYANA. "Roraima," *Rob. Schomburgk* 356/411 B (K, photo of type collection of *Calycophyllum stanleyanum*; NY, isotype).

COLOMBIA. ANTIOQUIA: Near Guapá, 53 km S of Turbo, 60 m, *Haught* 4621 (COL, NY). Near Medellín, *Cavender* s.n. (NY). BOLÍVAR: Lands of Loba, Amargamiento Rico, *Curran* 62 (F). Palotal, *Romero-Castañeda* 1672 (COL, F), 1691 (COL). SANTANDER: Barrancabermeja, 200 m, *Uribe Uribe* 6648 (VEN). Valle del Río Magdalena, *Uribe Uribe & Rojas* 6300 (VEN), *Uribe Uribe* 3042 (COL). 4 km E of Puerto Olaya, 150 m, *Fosberg* 21922 (NY). WITHOUT LOCALITY: *Schiefer* 747 (COL, F); *Montenegro* 1691 (COL); *García-Barriga* 13442 (COL); *Flor Claes* 865 (BR, photo NY).

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